



Update - Risk Management Process Metrics: Measuring Effectiveness of Risk Management

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Compliance vs. Effectiveness

- **Compliance:** “Do things the way I tell you to, and you will succeed.”
- **Effectiveness:** “It doesn’t matter *how* you do things, so long as you succeed.”
- ***Compliance* may—or may not—lead to *effectiveness*.**



Focus on the Decision-Maker

If we could measure how often the decision-makers use the information in the risk management system to make decisions we could probably tell whether it was effective—but we wouldn't know why it was (or wasn't).



Premise and Principles

Premise: Every project, program, and organization has a risk management process, whether it is planned or not, recognized or not. It may be effective or extremely limited, but if it can be understood and measured, it can be improved.

1st Principle: You can't count on people to communicate risks unless that communication benefits them in some way, personally and immediately.

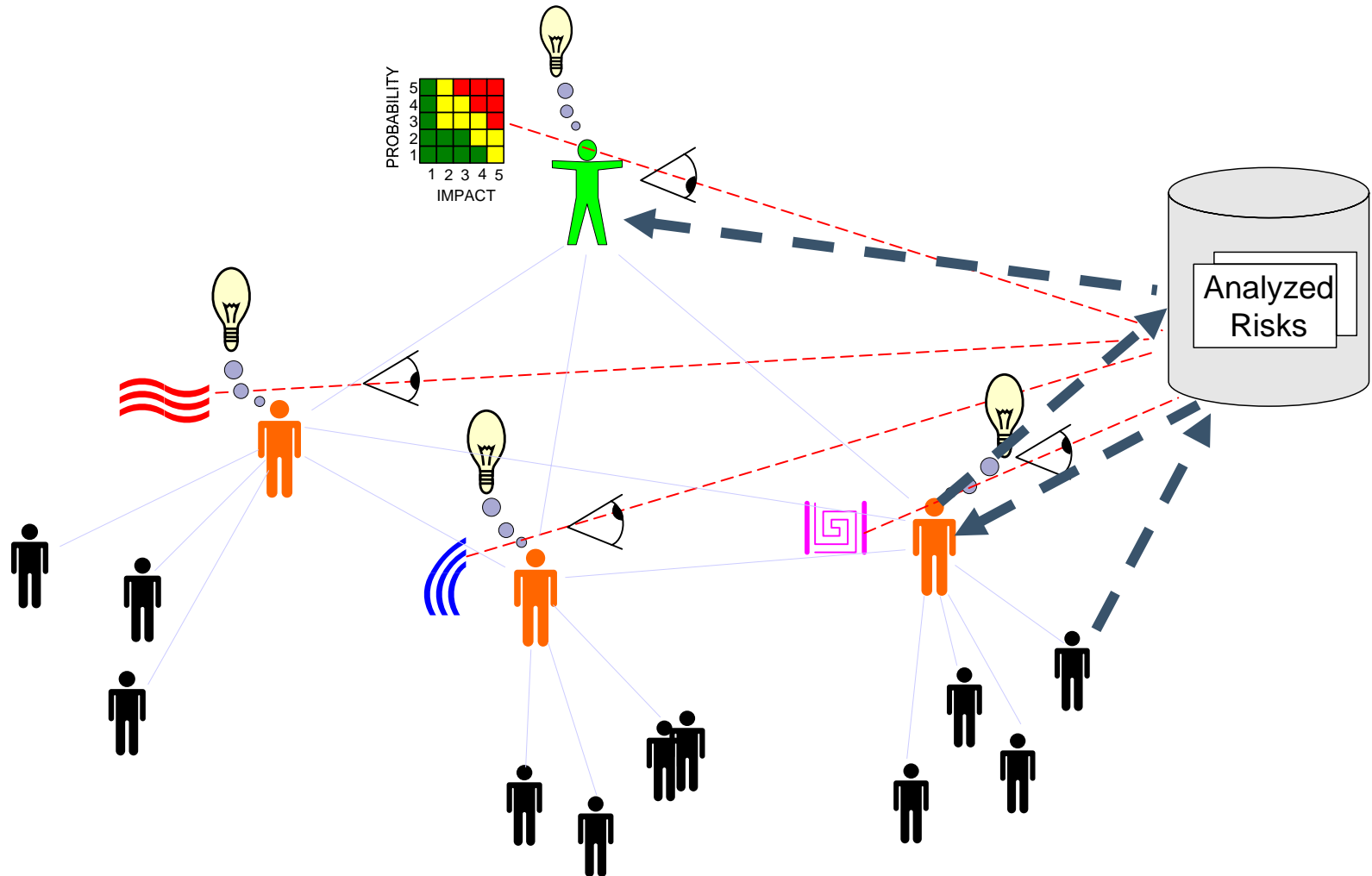
2nd Principle: You can't identify and analyze risks with consistency unless you understand your team's "picture of success," and those of the teams, managers, and stakeholders with whom you communicate. The pictures should be explicit and shared.



Key RM System Characteristics

- Users of the RM system perceive immediate personal benefit.
- Low barriers to input—*anyone* can pick up the “phone,” and they make “local calls” every day
- System handles high data input volume without overload
- Carefully structured information “packets,” to avoid misunderstanding
- Trust that information will not be misused
- Fast, reliable “throughput” from “worker bees” to the appropriate decision-makers
- Minimum “distortion” of information

Tool-Supported Risk Management





What Metrics Does IRMA Have Now?

- These are process metrics that IRMA currently produces:
 - **Staleness report**—metrics for how often the individual risk owners manage and update their risk information
 - **Mitigation Tardiness report**—timeliness metrics for mitigation plans
 - **Time in System report**—how long risks are worked in the system before closure
 - **Risk Organization Breakdown report**—metrics for type and quantity of open risks in the system broken down by organization



What Metrics Do We Propose to Add?

- The following are metrics we believe could be added to the IRMA tool or its administration to address the question of *effectiveness*.
 - **Speed**: Time it takes from input to be elevated to the appropriate decision-maker
 - **Fidelity**: Conformity to standard risk statement format and size; clarity
 - **Fidelity**: Top N risks compared to original input
 - **Synthesis**: Percent of risks that are correlated



Last Year's Summary

- Every project and program has a risk management system already—always has had, always will have.
- Getting decision-makers to switch from the risk management system they already have to a tool-driven system that is provided to them will only be successful if the new system is more *useful* than the one they already have.
- The tool-driven system will be more useful if it can be shown to be more *effective*.
- We believe we can measure “effectiveness” of a tool-driven risk management system, and we propose to try it on IRMA.
- Other groups in NASA can do this, too.



Data Collection & Analysis Methodology

A major challenge of this effort has been how to gather and present both *qualitative* and *quantitative* information about the risk communications network objectively and credibly

- Qualitative information (e.g., quality and fidelity of individual risk statements) requires good calibration standards and constant testing to assure that standards are not drifting
- Quantitative information (e.g., speed of data transmission) must be collected and analyzed with minimal human intervention

Our metrics are just initial data collection areas for use in process improvement, other areas will be incorporated and assessed in the future



Methodology—Qualitative Data

- Evaluation Panel of risk management practitioners was used to qualitatively evaluate and score risks in the database
- Monthly assessments and reassessments
 - Initially all risks in system were evaluated and scored
 - Thereafter, evaluation and scoring based on random sampling
- Consistent scoring card (risk attribute scoring scale)
 - Score card and the correlation factors for each of the scoring attributes
 - Re-evaluation of scores to verify consistency
- Consistent panel members (scoring evaluated for biases and shifts) with consensus reached on scoring

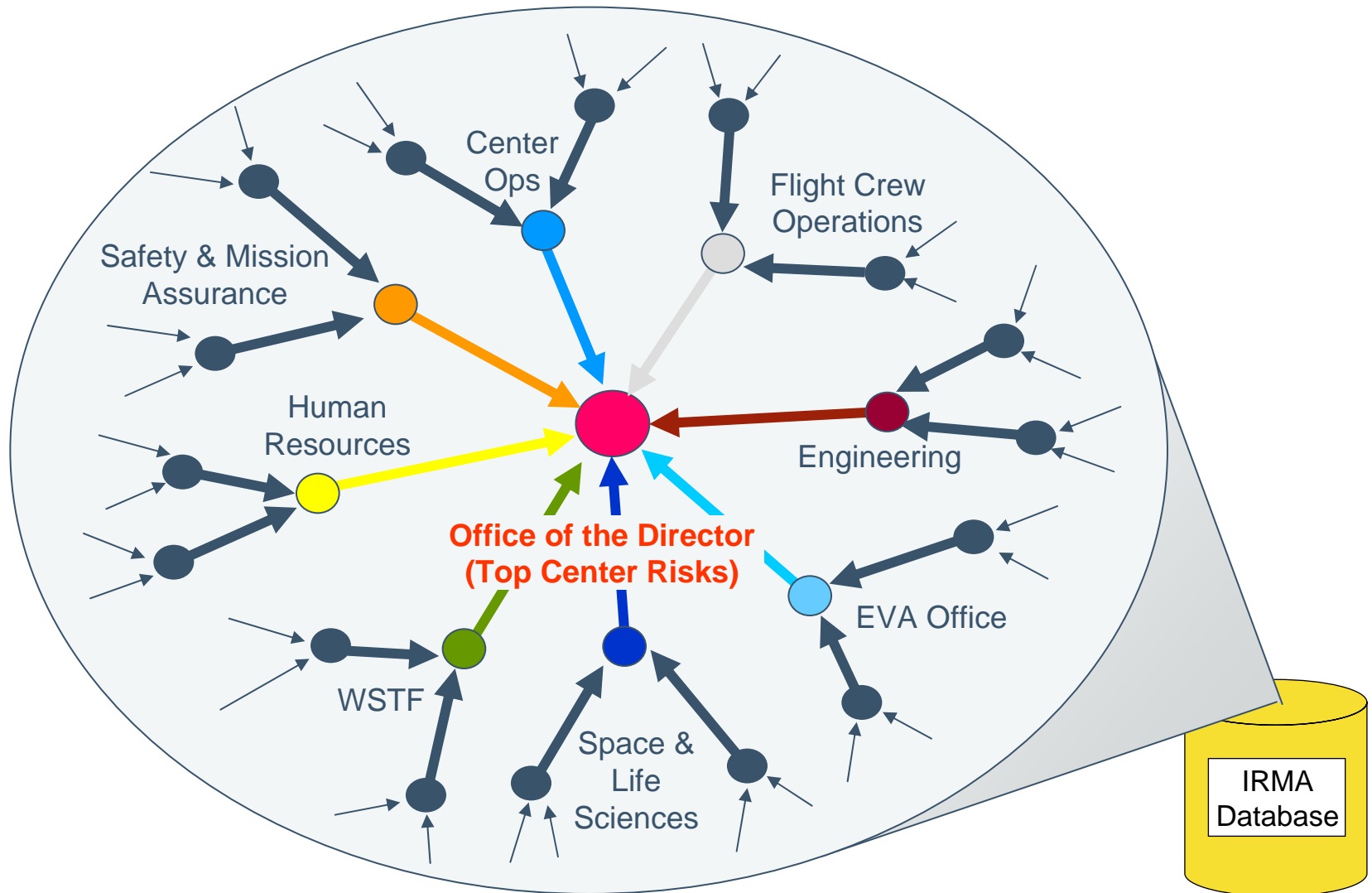


Methodology—Quantitative Data

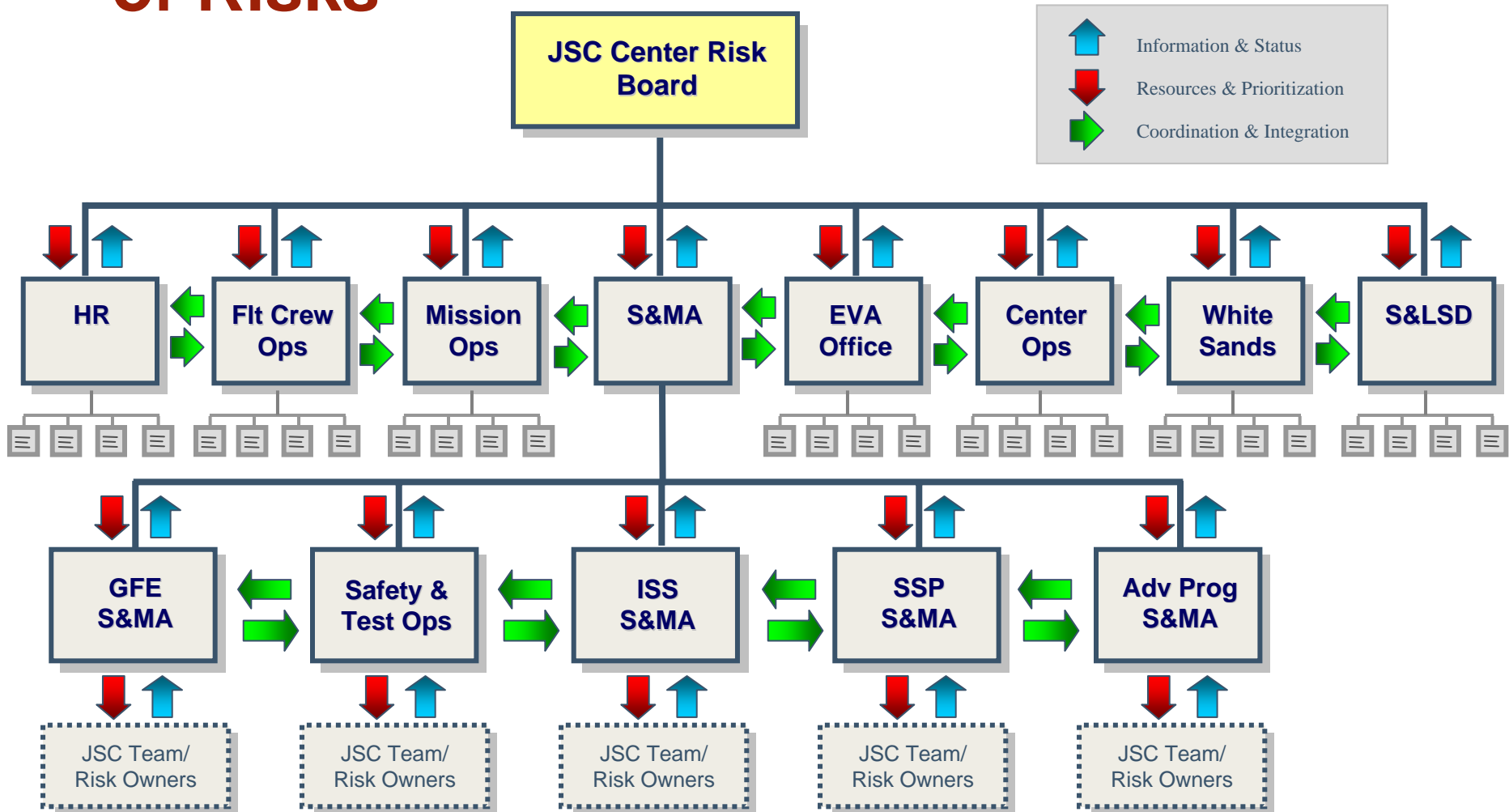
- Futron made modifications to the IRMA database to be able to capture and journal the events we needed to track
- Automatic analysis required definition of what we wanted to know (time from risk entry into system to appropriate decision-maker), balanced by what could be done at reasonable cost
- We are still “massaging” the data to find presentations that have high information content and impact
- The data presented here is far from final



IRMA Risk Network Mental Model



Process of Elevation and Integration of Risks

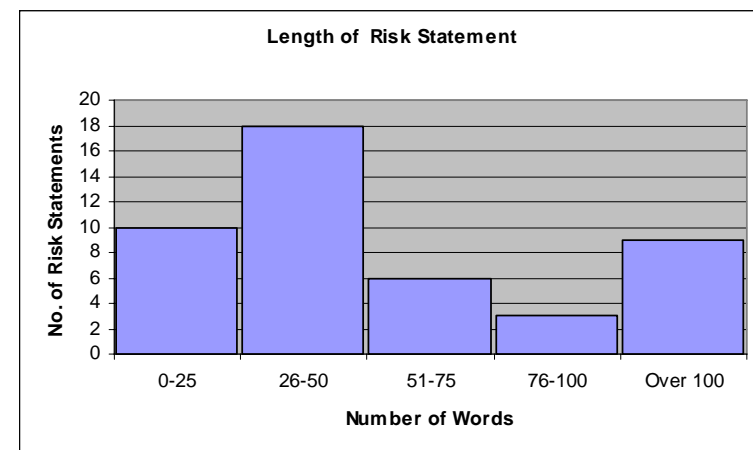
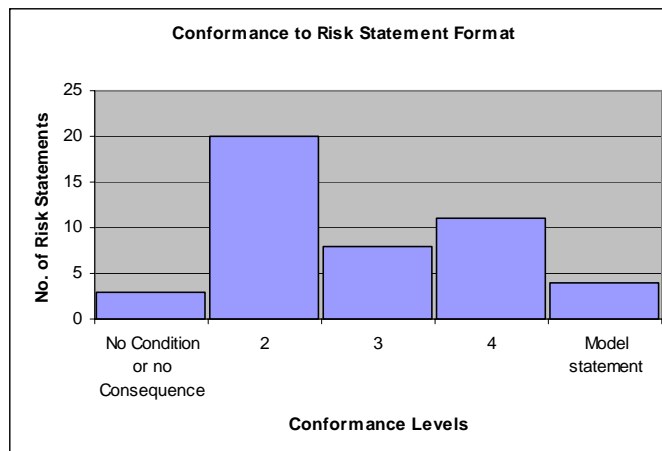
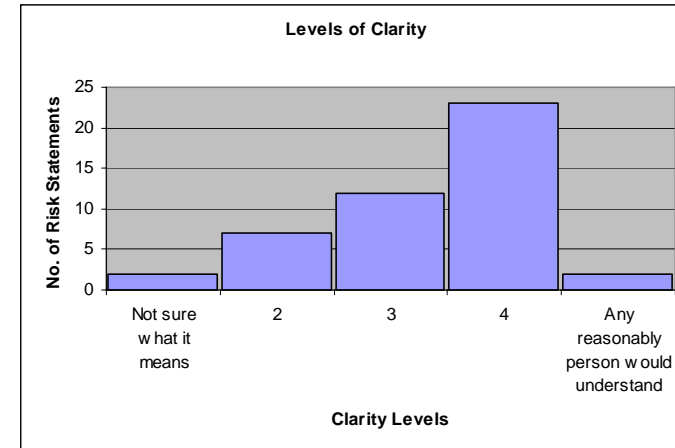
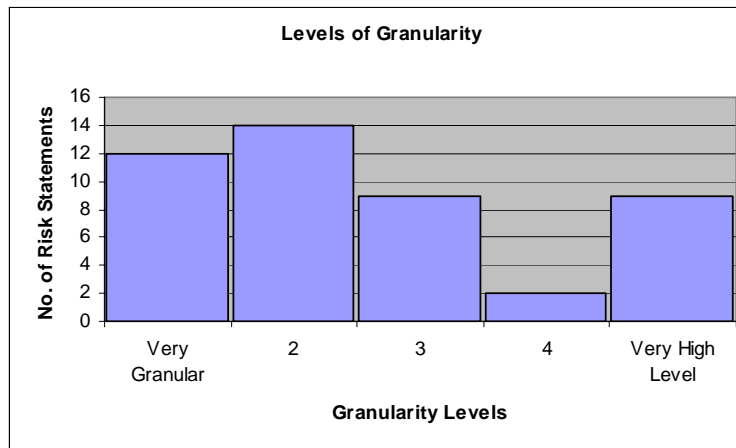




IRMA Risk Statement Quality Attributes

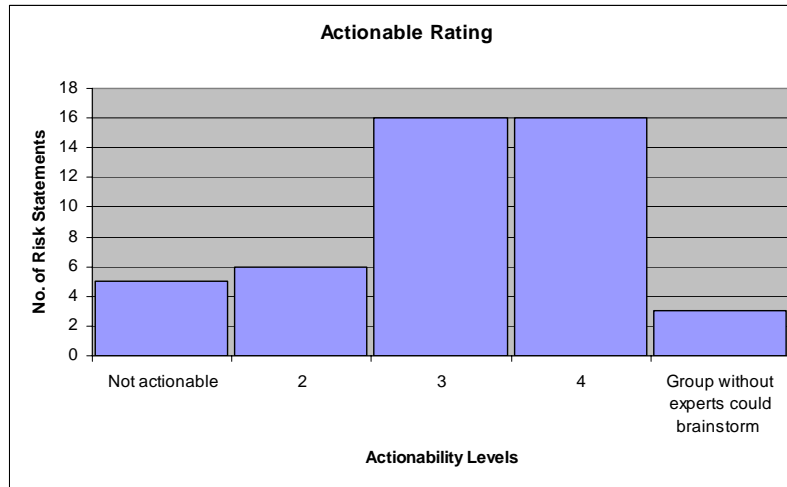


Baseline Data – 46 Risk Statements₁

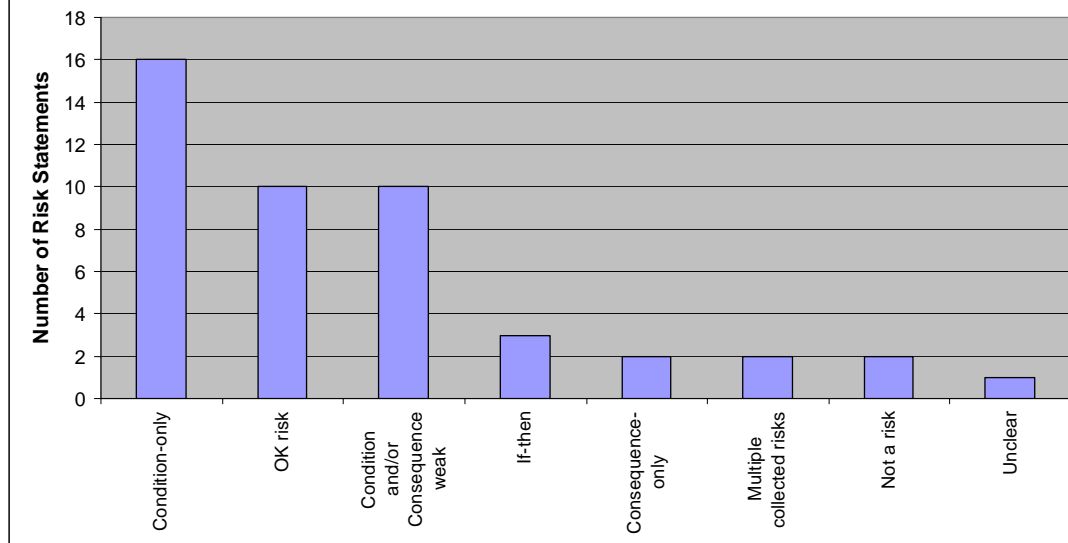




Baseline Data – 46 Risk Statements₂

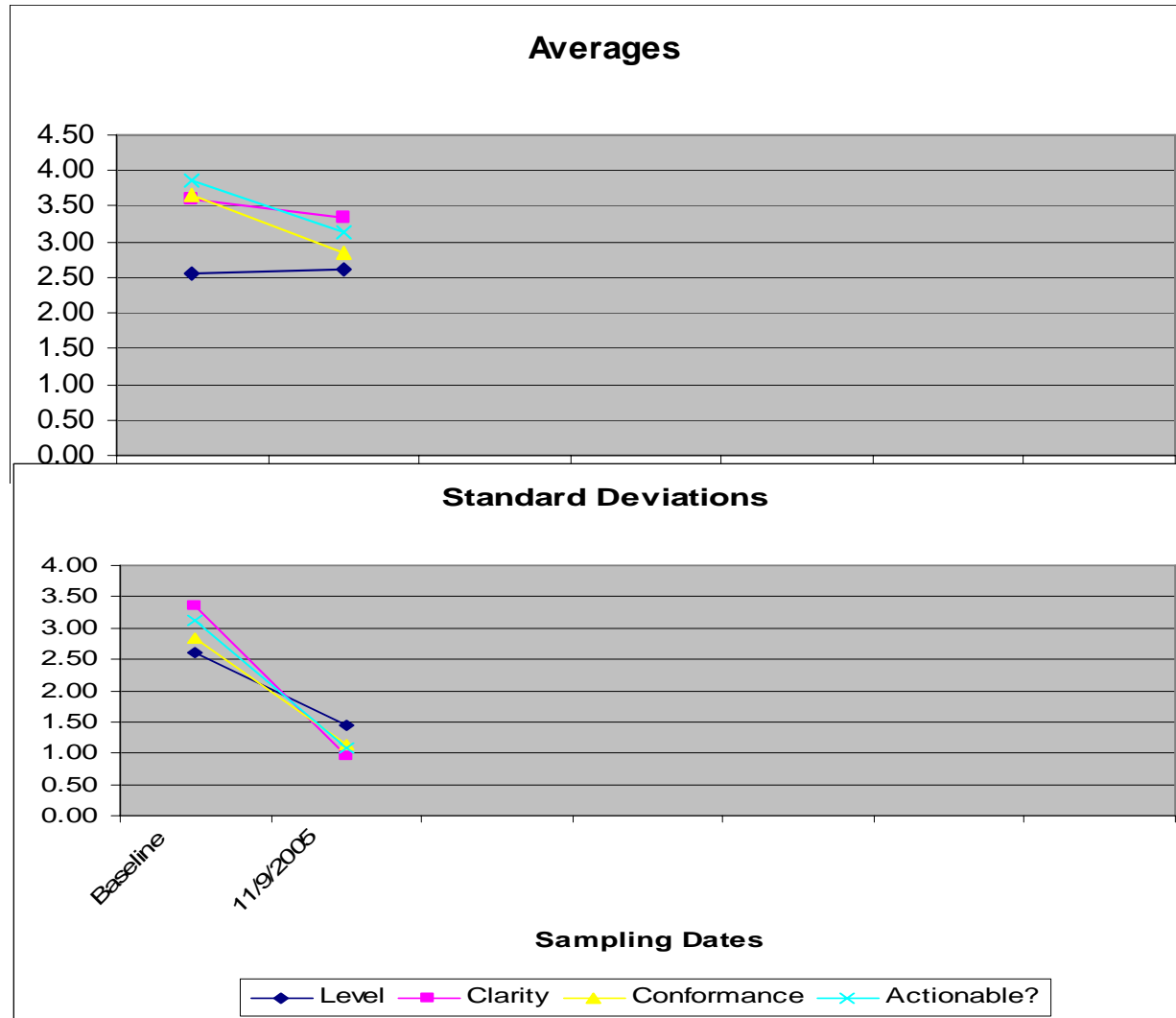


Categories of Risk Statements





Subsequent Quality Sampling



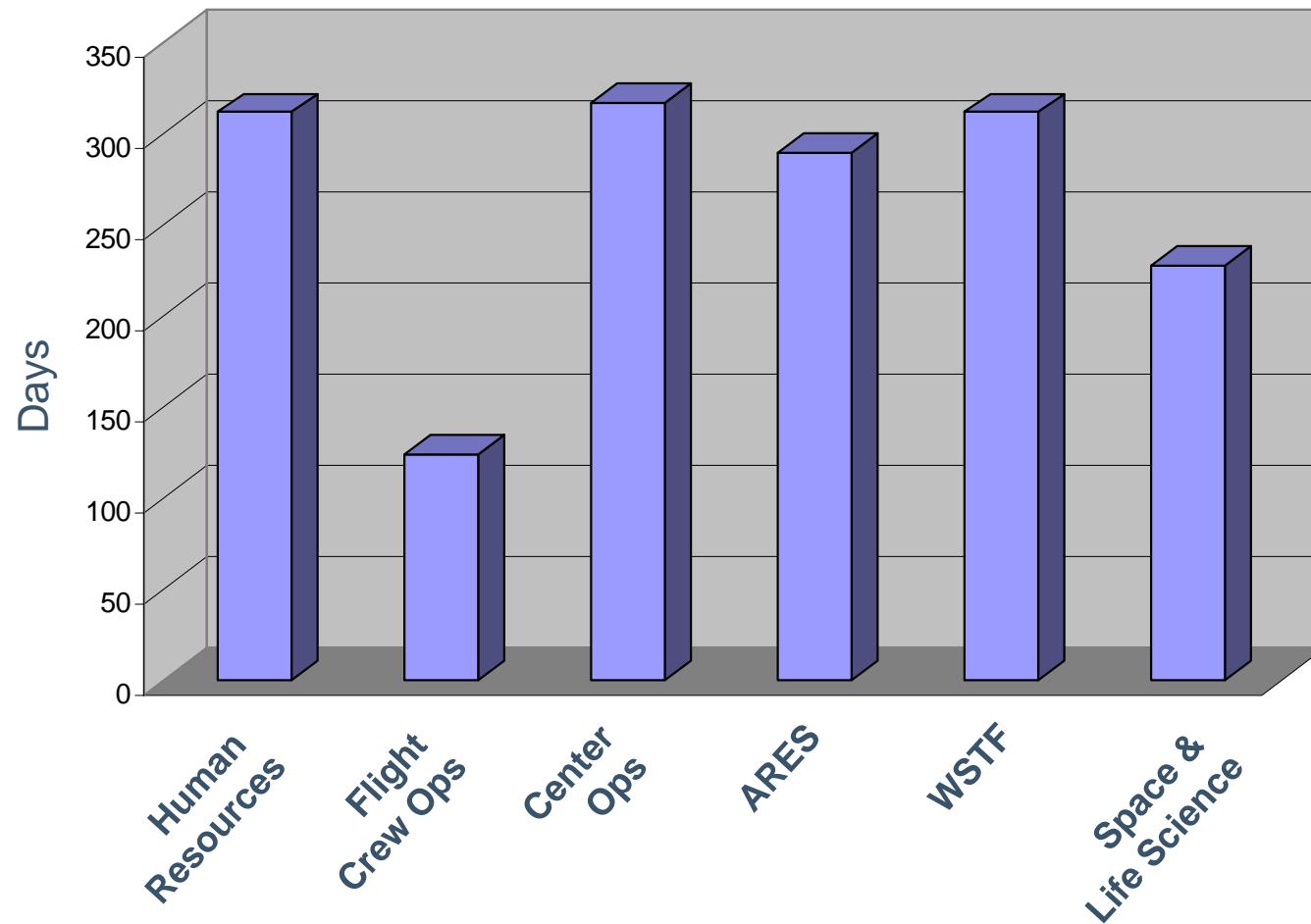
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Speed Data (Time to Reach Appropriate Management Level)

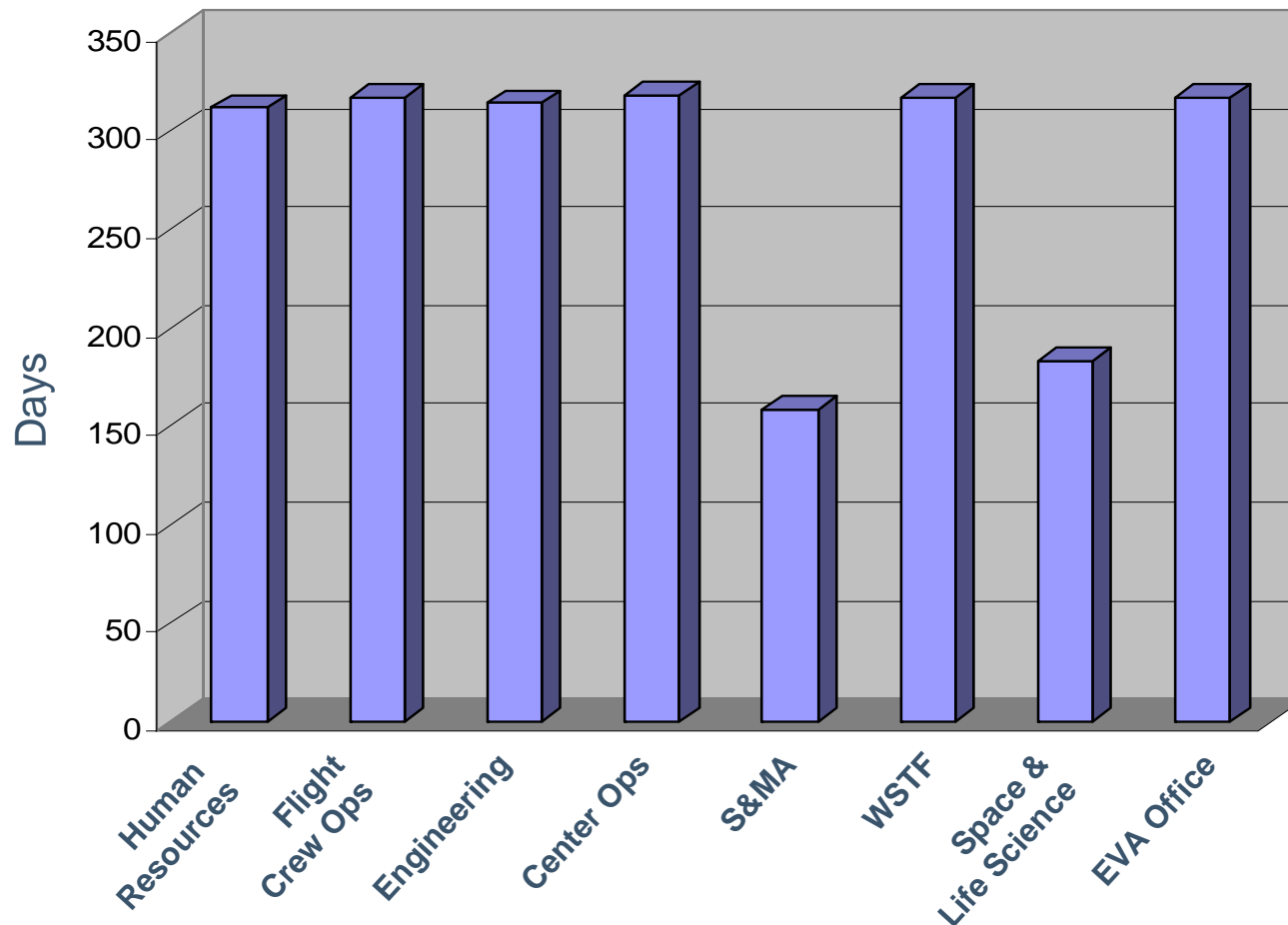


Avg Speed Data – Top Center Risks



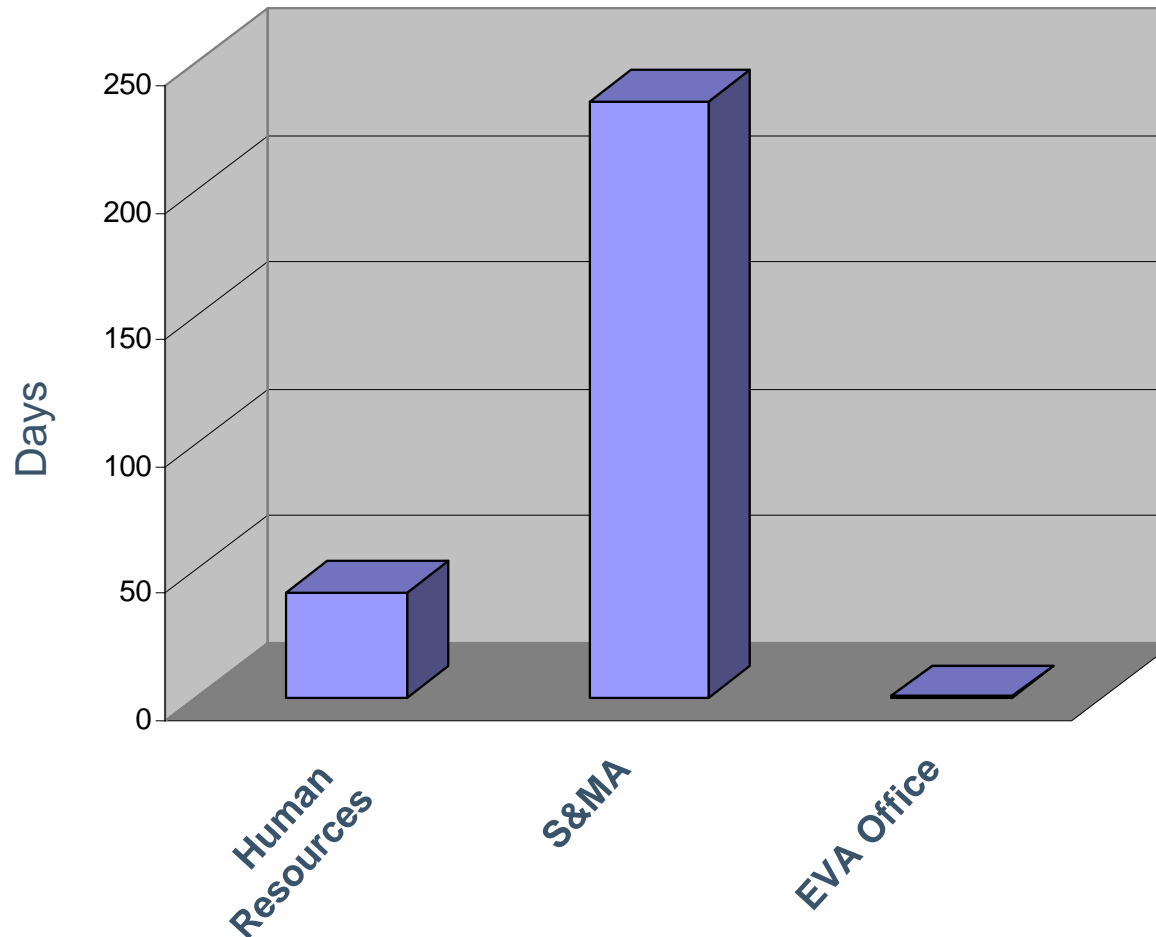


Avg Speed Data – Top Directorate Risks





Avg Speed Data – Top Organization Risks





Analysis/Recommendations

- Lack of management interest
 - Frequency of organization's RM meetings
 - Need to correlate lack of formal RM boards by organizations (management interest) into deficiencies in RM
- Lack of training
 - Statistics on training
 - Need to correlate lack of training within organizations into deficiencies in RM
- Lack of time
 - Stress surveys
 - Need to correlate stress levels within organizations into deficiencies in RM
- Lack of awareness
 - Questionnaire/surveys
 - Need to develop awareness questionnaires to correlate organization's awareness levels into deficiencies in RM



Additional Future Work

- Expand the use of metrics (develop metrics for synthesis and fidelity of the individual risks to the original input)
- Use metrics for process improvement - make adjustments to process and see affects on metrics (add more training, risk forums, etc)



Conclusions

- **Not everything has gone smoothly:**
 - It took a lot longer than expected to settle on our approach to data gathering
 - Interpreting qualitative information in a quantitative way (quality of risk statements) is difficult
 - The data is not yet having an effect on risk management system behavior
- **Nevertheless, this approach shows great promise:**
 - It provides a “big picture” view
 - It is non-judgmental
 - It will give the decision-maker reasons to trust or improve information in the risk management system
 - Can form the basis for a structured continuous improvement process for risk management